

APPENDIX U

Innovad

Innovative Development & Manufacturing

Saturday, June 19, 1993

FACSIMILE TO (415) 751-1840

Mr. Gurras

Mr. Kazuo Hashimoto
Hashimoto Corporation
285 Sea Cliff
San Francisco, CA

Dear Mr. Hashimoto:

I have completed studying the documents you lent to me. It appears that some of GlobalInk technology may be useful for my planned pager product. Mr. Tom Haghimoto and I will meet with them on June 22 at 1:30 to learn more about what they have.

I sent the GlobalLink documents to him by Federal Express on Friday June 18. You will receive another copy of the documents by US Mail next week.

Attached are patents that may be helpful to you regarding the GlobalLink Company. I searched up to 1992 databases and found two design patents assigned to Universal Cellular Inc.. I also searched for patents issued to James Wohl, Lawrence Bach, and Ted Naugler of Universal Cellular Inc. but did not find anything further.

I look forward to speaking with you after the meeting Tuesday to discuss GlobalLink and the License agreement you received from me last Friday.

With Best Regards,

Dan Henderson

Attachments (seven)

33300 Mission Blvd., Suite 131, Union City CA 94587 (510) 487-6702

United States Patent

(19)

Freeland et al.

(11) Patent Number: 5,148,473

(45) Date of Patent: Sep. 15, 1992

[54] PAGER AND RADIOTELPHONE APPARATUS**[75] Inventors:** Joseph C. Freeland, Lisle, Illinois; David M. Hess, Elgin, both of Ill.**[73] Assignee:** Motorola, Inc., Schaumburg, Ill.**[21] Appl. No.:** 773,759**[22] Filed:** Oct. 13, 1991**Related U.S. Application Data****[63] Continuation of Ser. No. 575,473, Aug. 30, 1991, abandoned.****[51] Int. Cl. H04M 21/00****[52] U.S. Cl. 379/59, 379/58;****379/57****[58] Field of Search 379/57, 58, 59, 61;****340/825.44****[56] References Cited****U.S. PATENT DOCUMENTS**

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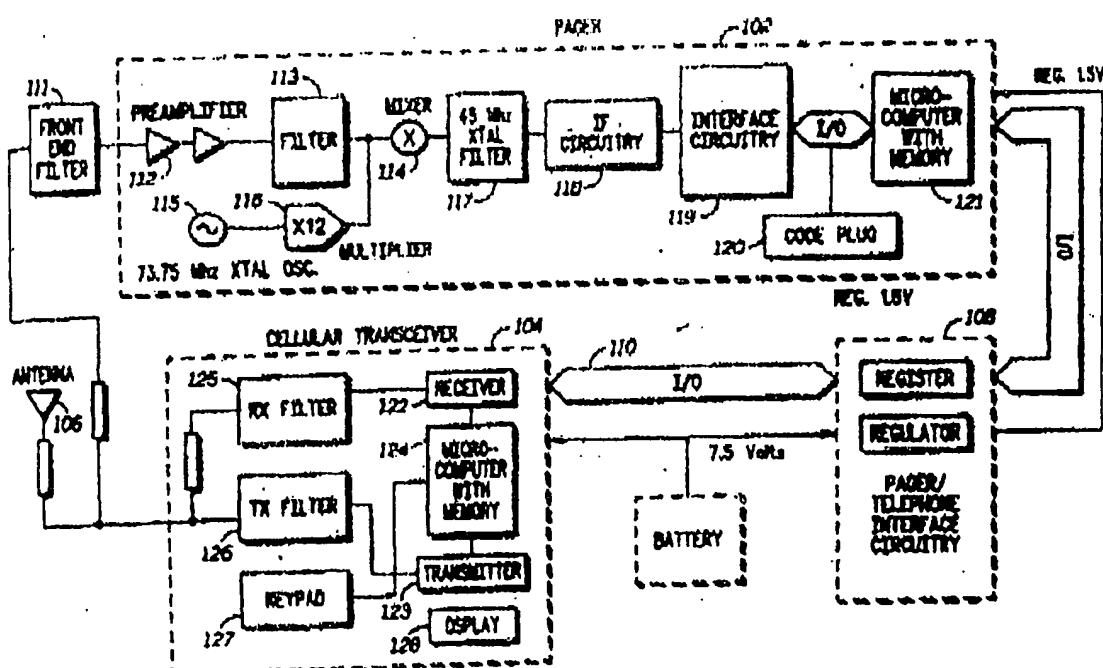
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63-224412 9/1988 Japan**OTHER PUBLICATIONS**

Financial Times article, "Designs on Pocketing the Cellular Market", by Geoffrey Charlish, Dec. 11, 1987. Published German Application DE3329267, by Künzel, Feb. 1985 (379-58).

Primary Examiner—James L. Dwyer
Assistant Examiner—Dwayne D. Bost
Attorney, Agent, or Firm—Kenneth W. Bolvin**[57] ABSTRACT**

The present invention encompasses a pager and radiotelephone apparatus (100) having a radio pager section (102) and a cellular radiotelephone section (104) into one unit. The apparatus (100) may automatically receive a plurality of pages while the cellular radiotelephone section (104) is on, communicating a cellular telephone call, or off and unanswered. The received pages are stored in the pager section (102) until the apparatus user acknowledges their receipt by a key-stroke. The pages are then transferred to the radiotelephone section (104) and stored in non-volatile memory for later use.

5 Claims, 3 Drawing Sheets

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5 stored in the non-volatile memory will remain for later recall. If the RCL pushbutton was activated, the scratchpad memory will be displayed but not called. Different location in the scratchpad memory can be recalled by activating the RCL pushbutton followed by a numeric pushbutton.

Once all the page data is moved out of the pager section (102), the PAGER ON/OFF line is pulled high momentarily by the 60HC11 microcomputer (120) to toggle the D flip flop (98), thereby turning the pager section (103) off. This clears the pager stored in the pager section's microcomputer (121). The PAGER ON/OFF line is pulled again to turn the pager section (103) back on.

One will know that various aspects of the present invention can be changed while still remaining within the scope of the invention. These changes may include the number of pages stored in the microcomputer such, the number of telephone numbers stored in the radiotelephone section, and the time the radiotelephone section remains on. In summary, a combination radiotelephone/pager apparatus has been shown that permits operation in both radiotelephone and paging systems.

We claim:

1. A method for controlling a combination pager and radiotelephone apparatus, the combination pager and radiotelephone apparatus including pager means for receiving on a paging radio channel a plurality of radio paging signals each having a telephone number with at least one digit, and the combination pager and radiotelephone apparatus including cellular transceiver means being coupled to the pager means through an interface circuit and having at least a recall and send pushbutton for transmitting on radiotelephone channels radiotelephone call signals, the interface circuit having a register for storing the telephone numbers, the method comprising the steps of:

receiving and storing in the paging means a plurality of radio paging signals each having a telephone number with at least one digit;
producing an indication signal when each paging signal has been received in the paging means;
moving the stored telephone numbers from the page log means into the register in response to a control signal;

counting in the cellular transceiver means in response to the indication signal, the number of paging signals received;
generating the control signal in response to activation of the recall or send pushbutton;
moving the stored telephone numbers from the register to the cellular transceiver means; and
transmitting, in response to activation of the send pushbutton, radiotelephone call signals using the

60 received read-out telephone number in the cellular transceiver means.

2. A pager and radiotelephone apparatus for transmitting radiotelephone call signals on radiotelephone channels and receiving paging signals on a paging radio channel, the pager and radiotelephone apparatus comprising:

an antenna for receiving the paging signals and communicating the radiotelephone call signals; pager means having first filter means coupled to the antenna for receiving paging signals on the paging radio channel and having memory means for storing the received paging signals, each paging signal having a telephone number with at least one digit, the pager means further providing an indication signal when each paging signal has been received, and the pager means being responsive to a first control signal for reading out the stored telephone numbers and being responsive to a second control signal for clearing the memory means;

cellular transceiver means coupled to the pager means, having at least a read pushbutton and a recall pushbutton, and having second filter means coupled to the antenna for receiving radiotelephone call signals on the cellular radio channels, the cellular transceiver means responsive to each indication signal for counting the number of paging signals received, and the cellular transceiver means responsive to activation of the recall pushbutton for generating the first control signal to enable the pager means to read out from the memory means the stored number of stored telephone numbers and thereafter generating the second control signal to enable the pager means to clear the memory means, and the cellular transceiver means responsive to activation of the send pushbutton for transmitting radiotelephone call signals using one of the read out telephone numbers;

3. A power source for generating a predetermined voltage to power the cellular transceiver means and interface circuitry, connected to the pager means, the cellular transceiver means, and the power source, the interface circuitry having regulation means for regulating the predetermined voltage to a lower voltage to power the pager means, the interface circuitry additionally having a memory register for temporarily storing the telephone numbers read out from the memory means.

4. The apparatus of claim 3 wherein the antenna is coupled to the first filter means by a transmission line.

5. The apparatus of claim 2 wherein the antenna is coupled to the second filter means by a transmission line.

6. The apparatus of claim 2 wherein the read filter means includes a receive filter and a transmit filter, each filter being coupled to the antenna by a separate transmission line.

United States Patent (19)

Levanto et al.

US005195798A

(11) Patent Number: 5,175,798
(43) Date of Patent: Dec. 29, 1992**(54) CELLULAR TELEPHONE SYSTEM
INTEGRATED WITH PAGING NETWORK****(75) Inventors:** Lauri Levanto, Märynummi; Jukka T. Ranta, Salo, both of Finland**(73) Assignee:** Nokia Mobile Phones Ltd., Salo, Finland**[21] Appl. No.:** 379,814**[22] Filed:** Sep. 4, 1990**[30] Foreign Application Priority Data**

Sep. 15, 1989 [FI] Finland

[51] Int. Cl.: H04M 11/00**[52] U.S. Cl.:** 379/87; 379/59;

379/63

[38] Field of Search: 379/37, 60, 61, 58,
379/63, 56, 59; 453/33, 56**[36] References Cited****U.S. PATENT DOCUMENTS**

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Article: Financial Times, "Designs on pocketing the cellular market", by Geoffrey Charlish, Dec. 11, 1987.

Primary Examiner—Curtis Kuntz

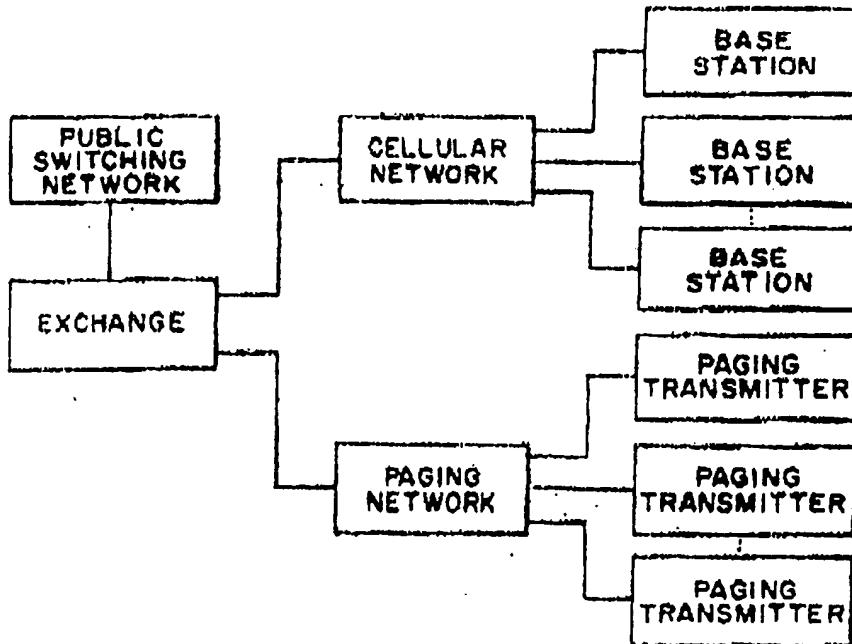
Assistant Examiner—Dwayne D. Bosi

Attorney, Agent, or Firm—Darby & Darby

[57] ABSTRACT

A telephone system with which a connection between two subscribers can be established, at least one of them being a mobile subscriber. The system includes a paging network composed of one or several extensive paging ranges, each of them having a paging transmitter (H1, H2) of its own, a small cellular network with an exchange and a plurality of base stations (T), and mobile telephones with which a pager has been integrated. When calling a mobile telephone, the transmitter of the paging range in which the telephone is known or assumed to be transmits a paging message to the telephone, whereby, when the telephone is in the neighborhood of the base station, the exchange of the cellular network establishes immediately a connection between the subscribers. No paging calls are lost because they are stored in the exchange of the cellular network, and on an appropriate occasion the pager of the telephone and the exchange compare the paging messages stored in the memories. The call can be transmitted from one base station to another during the call (handover).

19 Claims, 3 Drawing Sheets



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neighbourhood outside said paging range. The base stations are positioned in factories. The operational radius of a base station is about 200 m, corresponding to the power used in the service system. In the present instance, there may be about 30 simultaneous external calls and about 50 internal calls. An external call occupies one channel, an internal call two channels. Thus, 30 channels are needed within the system, 30 whereof being in the most loaded base station. The closed system only has one paging range, because of which only the requests to call which remain in the exchange are put through.

The telephones are personal hand telephones with which a call can be made in all factory buildings. When moving between the buildings and outside in the city, the telephone receives pings which can be discharged when back on the site.

Majority of the personnel live within the paging area so that call requests can be responded through a wire-connected network from home or the calls can be discharged when coming to the work place. If the telephone user lives outside the paging area, he has to read the arrived paging requests by registering the telephone.

An outgoing call can be made from one's own telephone on all sites.

The open system is characterized by an extremely extensive paging system, for instance national or multi-national. The size of the paging range is such that only a fraction of the users move from one paging range to another every day.

The system offers paging services, an immediate speech contact within the base stations, and an automatic response call service. The level of services may vary from range to range as the paging range is more covering than that of the speech traffic. As concerns subscriber classes, a less expensive paging service and a speech service may also be distinguished. The system may be so constructed that the apparatus of the present CT2 system are completely utilizable if the specification of the speech channel is adapted to be the same. The paging services and the handling of the arriving call necessitates a device conforming to the new system.

The system may also be implemented in the form of a special city network in the manner of the CT system, requiring a dense base station coverage, but also in the form of an extremely economic countryside network of low service level.

The city network of the open network is a small cellular network in which a home base station need not be defined. The paging range is uniform, whereby no registration is needed. The paging operation may be so constructed that very few shadows are established therein, and that the coverage of the base station service may be selected to conform to the demand. The base station network may be a small cellular network, whereby the power range of the mobiles is of the order of 100 mW, or a cellular micro network, whereby the power range is of the order of a few milliwatts.

If the receipt ranges of the base stations are overlapped, it is possible, without interrupting the call, to move from one receipt range of the base station to another, hand over, elsewhere the system only warns of the switching off of the call.

A delayed response call (paging memory) improves the level of services even in a defective base station network.

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In a city network, separate densely populated areas may be covered with the base stations within the range of a joint paging range.

The open system or a countryside network offers an economical alternative for implementing low service level. The entire area is typically covered with a paging network, the cities with a small or a micro cellular network, and in sparsely populated areas, the roads at intervals of e.g. 15 to 30 minute drives. The base stations are positioned in the marked parking sites because a mobile vehicle is able to travel over a receipt range during a call. The services of a countryside network consist primarily of requests to call and automatically reverse calls.

The open and the closed systems may also be combined. Private services employing a joint paging system may be included in an open system. Private base stations may be so defined in programs or using a private call channel that they show up in display only to the mobiles of the closed network. This kind of private service may be, for instance, an exchange of a company, whereby the enterprise buys a comprehensive paging service while attending itself to the telephone exchange within its own premises.

Operation through the open network may be allowed to the subscriber apparatus of the closed network outside the operating range of its own, but this may also be blocked.

The system and the procedure of the invention enables setting up a call between two mobile telephones so that an incoming call to a mobile telephone is possible and both mobile telephones can move from one receipt range of a base station to another during the establishing of the call, and during the call, so that the connection will not be switched off. Owing to the cellular system, one base station may serve several users. A significant characteristic feature is that even if the telephone were entirely switched off from time, or were located outside the paging range, the paging messages sent to it are stored in the exchange of the system, and no messages get lost.

It is obvious to a person skilled in the art to implement the system of the invention and the procedure for its use in a number of different ways, remaining, however, within the sphere of protection of the claims.

We claim:

1. A telephone system for establishing a connection between telephone devices of a first and a second user when a location of the telephone device of the second user is not known, comprising:

telephone devices of the first and second users, each of the telephone devices having a radio telephone with multiple channels and a pager for providing paging messages;

a paging network for transmitting paging messages between the telephone devices of said users, said paging network having at least two paging transmitters each establishing a respective paging range;

a cellular network for transmitting telephone calls between the telephone devices of said users, said cellular network having a plurality of base stations each with a receipt area for servicing the telephone devices located within range of the receipt area of said base stations, some of said base stations being located within at least one of said paging ranges;

and
at least one exchange associated with each of said base stations, said exchange being operative for

S,175,758

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setting up calls within the cellular network and for storing in a first memory said transmitted paging message and exchange storing the transmitted paging message in a first memory in response to an inability of the telephone device of said second user to receive the transmitted paging message when sent by the pager of the telephone device of the first user and thereafter transferring the stored paging message to said telephone device of said second user at a time when said telephone device of said second user can receive said paging message, and exchange comprising means for initiating a call from said telephone device of said second user to said telephone device of said first user by using said stored paging message when said telephone device of said first user has been switched off before connection is established between the telephone device of the second user and the exchange.

2. The system in accordance with claim 1 wherein said telephone device for the one user is provided with a display, keyboard, second memory and control unit, jointly used by said pager and mobile telephone.

3. The system in accordance with claim 1 wherein said cellular network further comprises means for transferring said call from a first of said plurality of base stations to a second of said plurality of base stations when said respective receipt range of said first and second base stations overlap and means for alerting said users when said call cannot be transferred between said first and second base stations.

4. The system in accordance with claim 1 wherein said cellular network further comprises means for updating said control of said exchange when the portable telephone moves between a first and second of said paging ranges so that transmitted paging messages are transmitted to said second paging range.

5. The system in accordance with claim 1 wherein the system is connected to a public switching network.

6. The system in accordance with claim 1 wherein said cellular network further comprising means for sending said stored paging message to set up the connection between said first and said second user, when the telephone device of said second user contacts said exchange of said respective one of said base stations.

7. The system in accordance with claim 6 wherein said connecting is performed when said second user is in said predetermined range of said respective base station.

8. The system in accordance with claim 1 wherein said base station includes a call channel and a speech channel.

9. The system in accordance with claim 8 wherein said exchange comprises means for transmitting a call set up message from said first user on said call channel to said base station of said second user, when said second user is outside the ranges of the base station of the first user.

10. The system in accordance with claim 8 further including means for informing said exchange when said cellular telephone moves between said paging ranges during said call.

11. The system in accordance with claim 1 further comprising means for storing messages in a second memory of said pager.

12. A method of operating a telephone system for establishing a connection between telephone devices of a first and a second user, comprising the steps of:

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initiating a call from the telephone device of a first user to a telephone device of a second user when a location of the telephone device of the second user is not known, the telephone devices each having a radio telephone and a pager for providing paging messages;

transmitting said paging messages between said users via a paging network, said paging network having a plurality of paging ranges;

accessing a selected cellular network via a selected one of a plurality of base stations, each of said base stations servicing the users located within a predetermined range of said base stations;

controlling the set up of said initiated call with at least one exchange associated with each of said plurality of base stations;

controlling said paging network by receiving said paging messages at said exchange;

storing said paging messages in said exchange if the telephone device of said second user cannot receive said transmitted paging message;

transferring said stored paging message to said second user when said second user can receive such transferred paging message; and

initiating a call by said exchange from said second user to said first user, by using said stored paging message, when said telephone device of said first user has been switched off before establishment of connection between said second user and said exchange.

13. The method in accordance with claim 12 further comprising the steps of:

transferring said call from a first of said plurality of base station to a second of said plurality of base stations when said respective predetermined range of said first and second base stations overlap.

alerting said users when said call cannot be transferred between said first and second base stations.

14. The method in accordance with claim 12 further comprising the step of updating said control of said exchange when the portable telephone moves between a first and second of said paging ranges so that transmitted paging messages are transmitted to said second paging range.

15. The method in accordance with claim 12 further comprising the step of transmitting said stored paging message to set up the connection between said first and said second user when said exchange is contacted by said second user through said respective one of said base stations.

16. The method in accordance with claim 15 wherein said exchange is contacted when said second user is in said predetermined range of said respective base station.

17. The method in accordance with claim 12 further comprising the step of transmitting a call set up message from said first user on a call channel to said base station of said second user, when said second user is outside the system.

18. The method in accordance with claim 12 further comprising the step of informing said exchange when said cellular telephone moves between said paging ranges during said call.

19. The method in accordance with claim 12 further comprising the step of storing paging messages in a second memory of said pager.

United States Patent [19]

Chu et al.

US00D327059

[11] Patent Number: Des. 327,059

[45] Date of Patent: ** Jun. 16, 1992

[54] CELLULAR TELEPHONE

[75] Inventors: Robie Chu, San Francisco; James P. Wohl, Beverly Hills, both of Calif.

[73] Assignee: Universal Cellular, Inc., Anaheim, Calif.

[**] Term: 14 Years

[21] Appl. No.: 613,369

[22] Filed: Nov. 15, 1990

[52] U.S. Cl. D14/138; D14/147;
D14/148; D14/248

[58] Field of Search D14/138, 151, 147, 248;
D16/11; 379/433, 440, 428

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Primary Examiner—Horace B. Fay, Jr.
Attorney, Agent, or Firm—Flehr, Hohbach, Test,
Albritton & Herbert

[57] CLAIM

The ornamental design for a cellular telephone, as shown and described.

DESCRIPTION

FIG. 1 is a front, top and right side perspective view of a cellular telephone showing our new design with its slide panel in extended position;

FIG. 2 is a front, top and right side perspective view thereof with the slide in a contracted position;

FIG. 3 is a top plan view thereof with its slide in extended position;

FIG. 4 is a right side elevational view thereof with its slide in extended position, taken on the lines 5—5;

FIG. 5 is a rear end elevational view thereof, taken on the line 5—5 of FIG. 4;

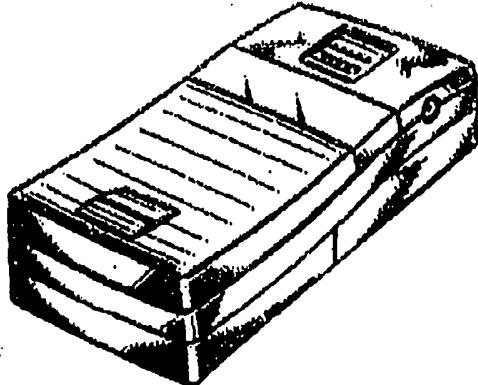
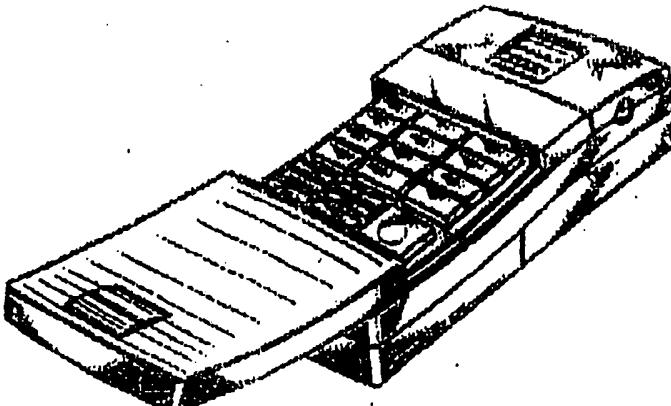
FIG. 6 is a left side elevational view thereof;

FIG. 7 is a front end elevational view thereof, taken along the line 7—7 of FIG. 6;

FIG. 8 is a top plan view thereof with its slide in contracted position;

FIG. 9 is a left side elevational view thereof with its slide in contracted position; and,

FIG. 10 is a bottom plan view thereof with its slide in contracted position.



United States Patent [19]

Atkins

[34] CELLULAR TELEPHONE

[75] Inventor: Warren Atkins, Anaheim, Calif.

[73] Assignee: Universal Cellular, Inc., Anaheim, Calif.

[10] Term: 14 Years

[21] Appl. No.: 492,110

[22] Filed: Mar. 12, 1990

[52] U.S. Cl. D14/138; D14/147

[18] Field of Search D14/138, 147, 148; 379/58, 59, 60

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[11] Patent Number: Des. 319,053

[45] Date of Patent: Aug. 13, 1991

D. 305,717 1/1990 Soren et al. D14/138 X
D. 306,298 2/1990 Sawada D14/148
D. 309,301 7/1990 Soren et al. D14/148
D. 311,916 11/1990 Tomimatsu et al. D14/148

Primary Examiner—Horace B. Fay, Jr.
Attorney, Agent, or Firm—Timothy T. Tyson

[57] CLAIM

The ornamental design for a cellular telephone, as shown and described.

DESCRIPTION

FIG. 1 is a top plan view of a cellular telephone showing my new design;

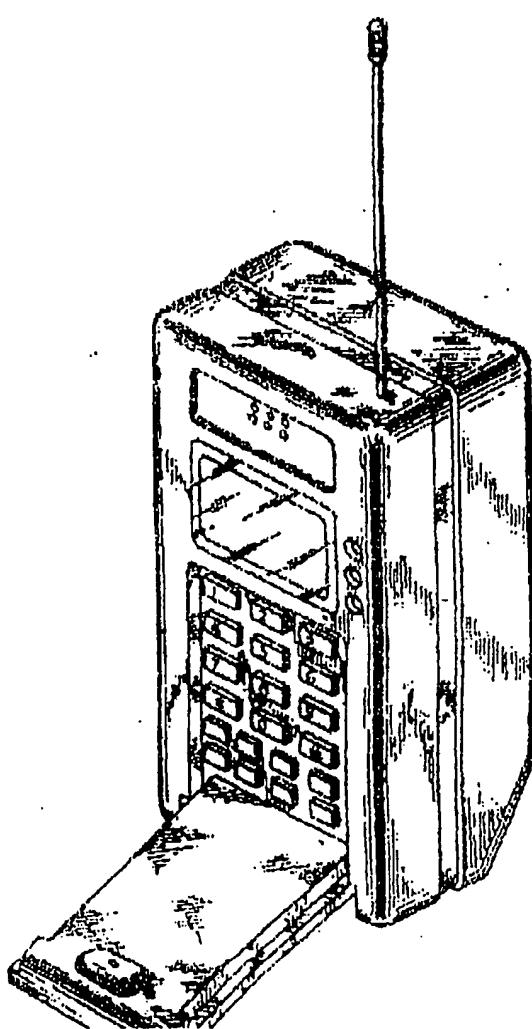
FIG. 2 is a rear elevational view thereof;

FIG. 3 is a front elevational view thereof;

FIG. 4 is a right side elevational view thereof, the left side elevational view being the mirror image thereof;

FIG. 5 is a bottom plan view thereof; and

FIG. 6 is a top, right, front perspective view thereof, with the door open and the antenna extended.



United States Patent [19]

Motorola et al.

US09111749A

[11] Patent Number 5,117,449

[45] Date of Patent May 26, 1992

[21] DUAL RECEIVER APPARATUS FOR
INTEGRATED PAGING AND
RADIOTELPHONE FUNCTIONS.

[19] Inventor: Michael P. Moreta, Algonquin;
Stephen V. Chubill, Palatine, both of
Ill.

[73] Assignee: Motorola, Inc., Schaumburg, Ill.

[21] Appl. No.: 001,680

[22] Filed: Apr. 8, 1989

Related U.S. Application Data

[63] Continuation of Ser. No. 091,810, Nov. 9, 1989, aban-
doned.

[51] Int. Cl. 1 H04M 11/00; G001B 3/28

[52] U.S. Cl. 379/57; 379/61; 379/63; 340/229.44

[30] Field of Search 379/57; 379/63; 340/229.44

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Primary Examiner—Thomas W. Brown

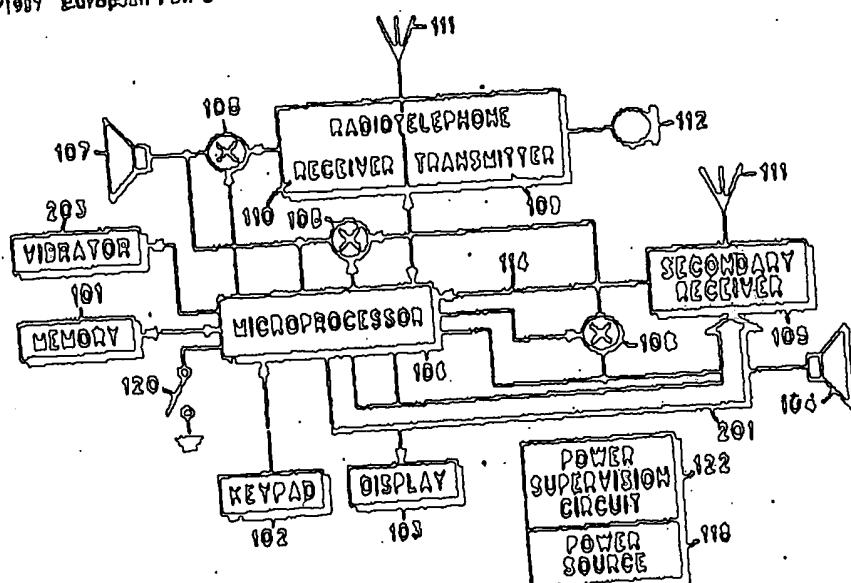
Assistant Examiner—William Cummings

Attorney, Agent, or Firm—Kernach W. Belvin

ABSTRACT

Both paging and cellular radiotелефone functions can be combined in a small, lightweight, single device by sharing most circuitry. The apparatus can receive paging signals simultaneously with radiotелефone signals because of dual receivers (103 and 110). When the paged party receives a page, an alert tone, a vibration, a visual indication, or a voice message is used to alert the party. Information extracted from the paging signal can be stored in memory (101) for later use. The paged party can select among messages stored in memory. If a message contains a telephone number, the paged party can call that number using the radiotелефone function of the touch of a button. The apparatus's keypad (102) can be used to program the paging function receiving frequency, identification code and type of paging system.

4 Claims, 8 Drawing Sheets



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United States Patent [19]
Sogaard Rasmussen

US005134717A

[11] Patent Number: 5,134,717
[45] Date of Patent: Jul. 28, 1992

[34] **RADIO TELEPHONE WITH REPERTORY DIALER**

[73] Inventor: Poul E. Sogaard Rasmussen,
Glostrup, Denmark

[73] Assignee: Motorola, Inc., Schaumburg, Ill.

[21] Appl. No.: 668,373

[22] Filed: Mar. 11, 1991

Related U.S. Application Data

[63] Continuation of Ser. No. 439,737, Nov. 21, 1989, abandoned.

[30] **Foreign Application Priority Data**

Nov. 26, 1988 [GB] United Kingdom 8827670
Nov. 26, 1988 [GB] United Kingdom 8827733

[51] Int. Cl. 1/04D 1/38; H04M 1/276

[52] U.S. Cl. 458/89; 455/186.1; 379/354

[58] Field of Search 379/355, 357, 354, 216, 379/144, 91; 453/89, 90, 185, 186, 344

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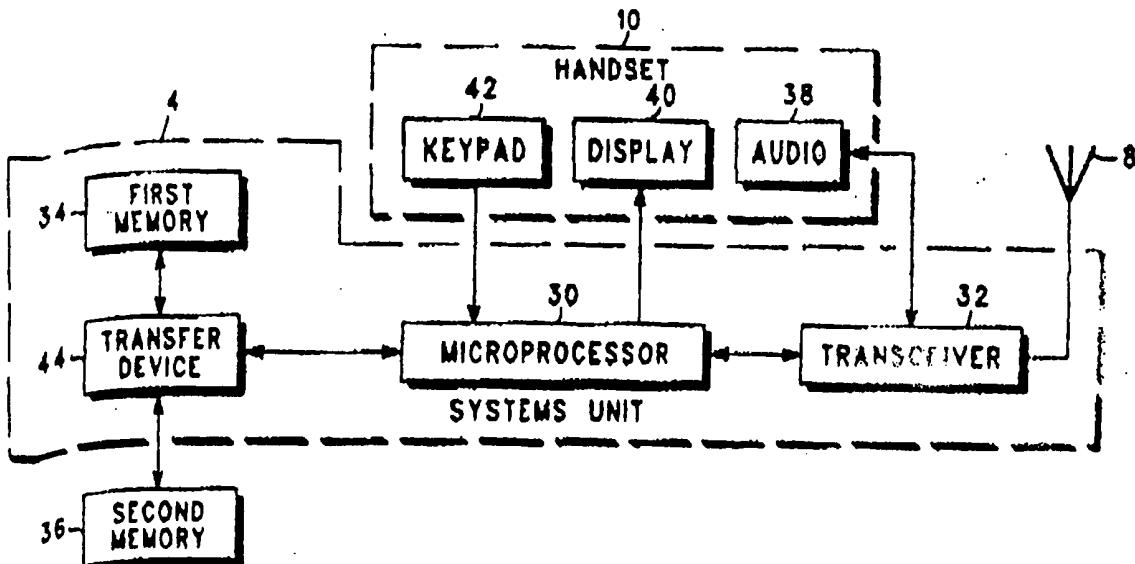
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[57] **ABSTRACT**

A radio (2) having: a first memory (34) for storing first information items; memory receiving slot (38) for temporarily receiving a second memory (30, 36) for storing second items of information; microprocessor (30) for accessing both said first and second memories; and user selective transfer device (42, 44) for causing an information item from one of the memories to be transferred to the other of the memories. In a preferred form the radio is a radiotelephone, the first and second items of information are telephone numbers and the second memory is a magnetic card or a smart card.

34 Claims, 2 Drawing Sheets



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